

Emergency Toilet Guidebook

After a major earthquake, we may need to know how to live without running water and working toilets for days, weeks, or possibly months. It is important that we learn how to do this safely. Deadly diseases can spread when human feces (poo) are not handled and stored safely.

Three Elements of Staying Healthy

To stay healthy after a disaster, you will need plenty of water and good sanitation practices.

#1 Water

Clean water will be an important resource after a major earthquake - perhaps the *most* important physical resource. It is essential to staying healthy. Of course, you will need to drink it to stay alive. But you will also need it to cook, wash yourself, wash dishes, clean wounds, etc. For information about water storage and treatment visit the [Regional Water Providers Consortium](#) website.



#2 Hand Washing

Proper sanitation is essential. Think about how you will wash your hands and prevent the spread of germs when there's no water in your pipes. Include soap and water in your emergency kit, as well as some alcohol-based hand sanitizer (60%+ concentration). You may want to consider building a [Siphon Pump Hand Wash System](#), which will make it easier to stay clean.

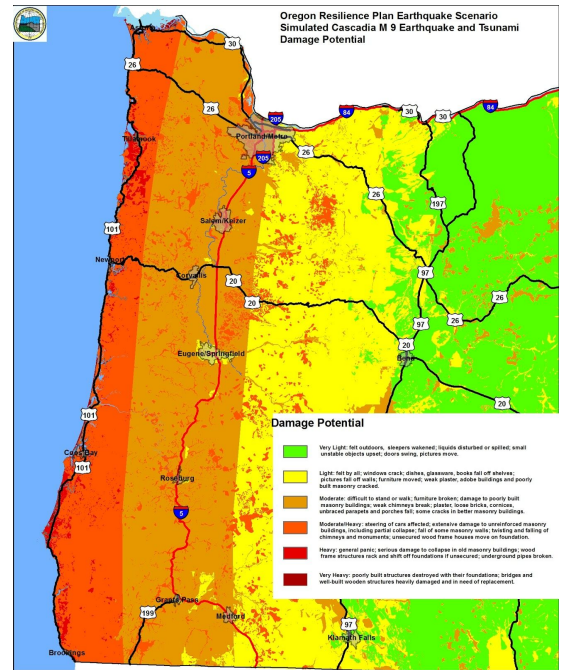
#3 Safe Storage of Poo

Even if you keep your space and your body clean, your poo could still make you (and others) sick. Keep reading to find out how to safely contain, store, and eventually dispose of your poo.

Project Background

Several recent disasters in the United States have caused damage to portions of water and wastewater systems, leaving major metropolitan areas without access to clean water and flushable toilets for prolonged periods. This has exposed the need for U.S. cities to improve post-disaster sanitation management plans and educate communities on how best to manage human waste. The need is even greater for those of us living in the Pacific Northwest. The Cascadia Subduction Zone earthquake will create a regional disaster unlike anything the U.S. has ever experienced, and it will take time for outside assistance to arrive.

In 2016, members of the Regional Disaster Preparedness Organization (www.rdpo.org) created a Task Force of subject matter experts from the Portland Metropolitan Region to begin to address pre- and post-disaster sanitation planning and public education. The Task Force consisted of experts in public health, sewage, waste removal, environmental sustainability, and emergency management. This document outlines their recommendations.



About These Recommendations

These recommendations are **only** for the first 2-4 weeks following a major earthquake and are based on the following assumptions:

- Sewage collection and treatment systems will be partially or fully out of service for many months following a large earthquake.
- Methods for handling sanitation must be simple, cheap, and effectively protect public health by limiting exposure to the waste.
- No single sanitation method is right for every situation – there must be several options to handle a variety of situations.
- While portable toilets work well in small events, the number required for this scenario far outreaches the initial availability. Additionally, they require frequent servicing (cleaning and emptying), which would be very challenging.
- Within 30 days of the initial disaster, local governments should be in a position to provide further messaging and instructions regarding human waste.

Method 1 The Twin Bucket System

The Twin Bucket System was developed in Christchurch, New Zealand after the February 2011 earthquake. The system meets the criteria of being simple, cheap and effective. The key to this method is separating pee and poo. This lessens volume and odor, making bucket contents safer and easier to store and dispose of. This method is ideal for dense urban areas with limited open space and locations with a high water table.

Caution!

It's very hard to keep surfaces clean without running water. When using emergency toilets, it's important not to touch human poo or let it touch other objects. Any surface that may come into contact with poo (such as a toilet seat) should be made of a non-porous, non-absorbent material that can be easily disinfected.

Materials:

- **Two sturdy plastic (five or six gallon) buckets.** One marked PEE or #1 and one marked POO or #2.
- **A toilet seat.** You can adapt a regular toilet seat or buy a seat that is designed for use with buckets (available at most camping stores, emergency supply retailers, etc.). If you can, purchase two - many people prefer to sit when going pee. Do **not** use a pool noodle! They are absorbent and porous. They are impossible to fully clean, which increases the risk of spreading disease.
- **Layering material.** Carbon-based materials work best. It should be lightweight, dry, and organic. The goal is to absorb moisture, reduce odor, and deter flies. You'll need about a handful to cover each poo. Examples: sawdust, shredded paper, bark chips (avoid cedar), dry leaves, dry grass clippings, peat moss, toilet paper, hamster bedding, etc.
- **A roll or box of heavy-duty plastic garbage bags.** 13-gallon size, 0.9 mil or thicker.

Frequently Asked Questions

Where can I buy buckets or get them for free?

Poo and pee buckets don't need to be food-grade, but they do need to be sturdy enough to support your weight. Most big-box stores have branded buckets for a few dollars a piece. But you can also find free ones by looking on at local classifieds websites or requesting them from businesses that frequently dispose of them, such as restaurants, bakeries, food production facilities, paint stores, etc.

You can get used, 5-gallon paint buckets from Metro (www.metro.gov). Their facility is located at 4825 N Basin Ave, Portland, OR. Delivery is not available. Call 503-234-3000 before going to make sure they have buckets available. If you'd like to request a large quantity, provide them with a week or two of warning. These buckets are used and have dried paint on the inside and outside. They usually do not have lids.

Do I need a toilet seat?

No, but you'll be *much* more comfortable if you have one. You could get creative with ways to make the top of a bucket more comfortable to sit on using everyday objects, but be mindful of the material. **It should not be absorbent.**

Where can I get free carbon-based materials?

Collect and crush fallen leaves or grass clippings and store them in a garbage bag. Ask a lumber yard or local furniture company for a bag of sawdust. Ask a business for a bag of shredded paper. Be creative!

A source of very low-cost carbon materials is wood pellets that are made for pellet stoves. When mixed with water (about 1 cup of water to 2 cups of wood pellets), it can give you about 6 cups of sawdust. Remember to store extra water if you plan to use pellets.

Do I have to use 13-gallon bags?

No, but make sure the bag is big enough to tie shut once your bucket is half full, and make sure it's a sturdy (heavy-duty, 0.9 mil or thicker) bag so it's less likely to tear.

Separating Pee and Poo:

Pee has volume. Poo has pathogens (bacteria, viruses, and other microorganisms that can cause disease). When you mix pee and poo together, you get a large volume of pathogens. It also produces a terrible odor. If you keep them separate and layer the poo with carbon-based materials, the poo is able to dry out and reduce to a smaller volume, and the pee can be disposed of easily and harmlessly.

Using the Pee Bucket:

- Pee in the pee bucket, but always put your toilet paper in the poo bucket.
- Dilute pee with water (if possible), and spread it on a permeable surface, such as your lawn, garden, or the ground. Local governments may develop alternative urine collection sites in order to avoid water table contamination.
- **Stay informed! Look for instructions from public agencies on how to get rid of waste.**

Frequently Asked Questions

If I pour it in my garden, will the pee kill my plants?

Urine (pee) is generally sterile unless you have kidney disease or another illness that causes your body to expel toxins in large quantities. Urine is mostly made up of water and nitrogen, which is a key component of fertilizer. If you dilute urine with water and pour it in a different place each time, your plants won't mind a bit. This article explains ways you can use urine in your garden:

www.lifehack.org/articles/lifestyle/8-reasons-why-you-should-pee-your-garden.html

Using the Poo Bucket:

- Line your poo bucket with a sturdy trash bag.
- When using the poo bucket, it's okay to put toilet paper in the bucket.
- After each use, cover the surface of the poo with a carbon-based material (see the materials list above). This will help reduce odors and minimize the attraction of flies.
 - Do **not** put an airtight lid on the bucket. Allowing some air flow will help the poo dry out and reduce in volume. Do **not** fill the bucket more than halfway full.
- Once you've tied the top of the bag, double-bag it to ensure the contents don't leak.
- Store your poo bags in a safe location away from food and water, kids, pets, flies, rats, etc.
 - Do keep poo bags, animal waste, and soiled diapers together and separate from other garbage. Do **not** put poo bags in your regular garbage, yard debris, or recycling bins. Do **not** dig a hole and bury your poo bags.
- Take care when using the poo bucket and bagging the contents. Afterwards, always wash your hands with soap and water or hand sanitizer.
- Consider talking with neighbors about shared collection sites.
- **Stay tuned to emergency radio broadcasts for further info from local agencies about what to do with your poo bags, and always handle them with extreme care.**

Frequently Asked Questions

Why put poo in bags and not just store it in lidded buckets?

After a major quake, we could be without running water and flushing toilets for weeks - maybe even months. Our buckets will fill up quickly. Using plastic bags means we don't need to store dozens of buckets. Also, if you fill an unlined bucket with poo, at some point you're going to need to dispose of it. Pouring it in your toilet is a bad idea - it will undoubtedly splash and create an unsafe mess.

Why not compost poo?

Poo can be composted, but it takes knowledge and time to do it safely. It's not as straightforward as composting kitchen scraps. If done incorrectly, it could create a major public health issue. Since most people don't know how to safely compost poo and they likely won't have access to the internet to learn how after a disaster, our recommendation is to contain the poo in bags (or dig a latrine, when appropriate).

Where should I store my poo bags?

There's no one answer that works for everyone, as circumstances will vary. What's most important is that you store poo bags away from food and water, kids, pets, flies, rats, etc. but not in the regular garbage, yard debris, or recycling carts that will eventually be emptied by garbage haulers (see below). However, if you have another garbage can that won't be picked up by haulers, you could use that. Or you could find a spot in your shed, garage, or home. Keeping bags of poo in your home may sound strange, but it's better than creating a public health hazard. And if it's double bagged, it shouldn't smell.

Why shouldn't I put my poo bags in my garbage, yard debris, or recycling cart?

We don't currently have a way to collect poo bags from these carts. Garbage and recycling systems aren't designed to collect human waste. Garbage is compacted when it's transferred to the truck, at the transfer station, and at the landfill. At all these points, the bags will tear and the contents will get smeared around, creating hazardous situations for all workers involved with moving garbage. Plus, trucks are not designed for liquid, so when a poo bag tears in a truck, it would leak onto city streets and potentially spread disease.

Why shouldn't I bury my poo bags?

It is fine to bury your poo without plastic bags - in a pit latrine. However, burying the plastic bags causes a problem. The bags take a very long time to degrade, and this will prevent the poo from breaking down safely.

Where should I put used feminine hygiene products?

Put them in the poo bucket if you're using the Twin Bucket system. Otherwise, dispose of feminine products in your regular garbage bin.

What if I can't easily separate my pee and poo - or get my kids to.

Do your best! That's all we can do in an emergency. If pee gets in your poo bucket, add a little extra layering material to help it dry out.

What are we going to do with all those plastic poo bags?

The solution will vary depending on where you live. The RDPO [Disaster Sanitation Task Force](#) is working on a plan which identifies numerous methods to collect, transport, and dispose of bagged feces after a major earthquake. The plan will be finished in 2020 and distributed to jurisdictions throughout the region in 2021 so they can embed sanitation into their disaster plans. After an incident, jurisdictions will assess their damage and select the collection, transportation, and disposal methods that make the most sense for their circumstances. They will communicate instructions to community members at that time. This is why it's so important that everyone knows how to [Stay Informed](#) after a disaster.

Method 2 Latrines (Pit Toilets)

A latrine (or a pit toilet) is a hole in the ground that collects human waste (poo and pee) in an emergency. This method is also simple, cheap and effective. It's ideal for more rural areas with wide open spaces. It can still be used in urban areas, as long as location guidelines (see below) are followed.

Before a Disaster:

1. HOAs, property managers, and multi-family dwellings should pre-identify locations for latrines.

2. It might not be an option to “call before you dig” after an emergency has occurred. Learn where your underground utilities are located now. You wouldn’t want to hit a utility line that would further delay a return to service.

Instructions:

1. To minimize the number of holes you need to dig, talk with your neighbors about using shared pits, and come to an agreement about the location of pits.
2. Dig a hole, and save the soil that you removed.
 - a. Location: It should be at least 10 feet from your residence, 10 feet from your property line, and 100 feet from creeks and wells.
 - b. Depth: Dig down at least two feet. Four feet is optimal, but many areas have a high water table. If you see water, stop!
 - c. Width: The hole should be about two feet wide.
3. After each use, cover your poo and pee with dirt.
4. When filled to the one-foot level, consider the latrine full. Allow space to cover it with at least an additional foot of dirt.
5. Mark the location of each latrine so they can be treated during disaster recovery.
6. Dig a new hole as needed.
7. Used toilet paper goes into the latrine, but nothing else. Do **not** bury plastic bags.

Frequently Asked Questions

Do I need a separate latrine for pee and poo?

No, not for this method.

Method 3 Septic Systems

If you have a septic system and it survives the shaking, you’ll be in better shape than many. But you should know where your system is and what it consists of before an emergency occurs! It’s a good idea to know this anyway for maintenance purposes. Oftentimes, counties have a development record of where septic systems were installed. The DEQ onsite wastewater management webpage has a link to help you locate a contact in your county (www.deq.state.or.us/wq/onsite/onsite.htm).

Signs Your System is Working:

- Your water supply is functioning.
- You have electricity (some systems require power for a pump).
- Toilets flush and sinks drain properly.

Signs Your System is Not Working:

- The earth has moved around your septic system.
- There are abnormal wet or soft spots in your yard.
- You smell sewage odors.
- Water or sewage is backing up in downstairs-bathroom or floor drains.

If the level in your septic tank is high, then sewage might not be leaving the tank. If the level is low, then the tank itself may have been compromised or the piping between the house and tank may be damaged. You can usually easily examine the tank level when there is access to the ground-level inspection point. Unless there is a pump, all tanks have an inlet and outlet pipe, and the normal sewage level is at the outlet pipe level. Most of the time you can see this pipe when you open the access to the tank. DO NOT go into the tank.

If You Have Problems:

If any of these apply, your system could be damaged and may not function properly.

- Limit use of water in your home and use the Twin Buckets or a Latrine until repairs are made.
- Keep people and pets away from your septic system until it is back in service.
- Only use a licensed professional to repair/replace your septic system.

If sewage is staying below ground and is not backing up, continued use should be okay. Any scenario where exposure to or contact with the waste could occur should be avoided.

Additional Resources **PHLUSH**

[Public Hygiene Lets Us Stay Human](#) (PHLUSH) is an organization that provides education and advocacy for equitable public restroom availability and preparation for a pipe-breaking seismic event. Their website provides a great deal of information about disaster sanitation. The RDPO recognizes the quality work they have done but provides a few warnings.

Caution!

- Composting poo is a long-term process that needs electricity and/or a lot of time (1-2 years). It needs to be done **very carefully** to avoid spreading disease.
- If you place your poo bags in garbage or recycling carts for temporary storage, they should **not** be left out for regular garbage/recycling pickup when services resume. Stay tuned to emergency radio broadcasts for further info from local agencies about what to do with your poo bags, and always handle them with extreme care.

Supply List for Emergency Toilets

For all methods:

- Toilet paper
- Disposable plastic gloves
- Plastic garbage bags (for disposing of gloves)
- Feminine hygiene products
- Soap and water
- Alcohol-based hand sanitizer (60%+ concentration)

For a latrine:

- A shovel

For the twin bucket system:

- Two sturdy plastic buckets (five or six gallon size)
- A non-absorbent toilet seat that fits your buckets (optional)
- Layering material
- A roll or box of **heavy-duty** plastic garbage bags

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Contact the RDPO

If you have questions about this guidebook, please contact the Regional Disaster Preparedness Organization at rdpo@portlandoregon.gov or visit www.rdpo.org.



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